

nation, however, convinces me that it is a distinct species, different from any eastern Barbet yet known.

I propose to call it

Cyanops monticola, sp. n.

♂ *ad.* Prasino-viridis, alis et cauda saturatoribus; fronte et loris smaragdinis, sincipite et pilei lateribus læte cyaneis; plaga magna verticali scarlatina usque ad nuham producta; facie laterali et regione parotica pallide cyaneis, fascia supraparotica smaragdina; genis gulaque pallide flavis, hac infra cyanescente et macula scarlatina ad latera juguli posita ornata; præpectore et corpore reliquo subtus pallide smaragdinis.

Long. tot. 9·0, culm. 1·15, alæ 3·9, caudæ 2·5, tarsi 1·05 poll. Angl.

The nearest ally of this species is *Cyanops incognita*, Hume, from Tenasserim. It differs, however, from that species in its larger size, in the absence of the black facial stripes and red loreal spot, as well as in the colour of the throat, which is bright bluish green in *C. incognita*.

I take this opportunity of observing that the *Chlorura* which I described in the 'Ibis' for 1887 (p. 453) as *C. hyperythra* of Reichenbach turns out to be distinct from that species, having the rump and upper tail-coverts like the back. I propose to call it *Chlorura borneensis*.

LII.—*The Polyzoa of the St. Lawrence: a Study of Arctic Forms.* By the Rev. THOMAS HINCKS, B.A., F.R.S.

[Plate XXI.]

[Continued from vol. i. p. 227.]

Suborder * CHEILOSTOMATA.

Family Escharidæ (part.), Smitt.

RHAMPHOSTOMELLA, Lorenz.

Rhamphostomella, Lorenz, Bryozoën von Jan Mayen, gesammelt von Dr. F. Fischer, Arzt der österreichischen Expedition auf Jan Mayen, bearbeitet von Dr. Ludwig Lorenz, 1886.

This genus has been instituted by Lorenz for a group of species which is very characteristic of the Arctic and Northern

* In the first part of this Report ('Annals' for March 1888, p. 215, line 12 from the top) for "Subclass" read "Suborder."

seas and is well represented in the St. Lawrence. The *Eschara scabra* of Fabricius, subsequently described at length and figured by Smitt, is a member of it and the first of which we have any notice. Smitt referred this species and kindred forms to the genus *Cellepora*, and I have followed him (but only provisionally) in a paper (1877) containing descriptions of new Arctic Polyzoa. Probably Lorenz is right in regarding them as a distinct generic group, though his diagnosis may require amendment. They are properly detached from *Cellepora*, a group which has already been dismembered to some extent by Smitt, and which awaits a more thorough revision. The species included in the genus *Rhamphostomella* have some affinity with *Mucronella*, but they are differentiated from it by special characters and a general habit which are sufficiently significant.

Lorenz's diagnosis of his new genus is as follows:—

Zoëcia generally oval, very regularly alternate, slightly prominent; orifice terminal, broad, semicircular, closed by a thin membranous operculum, surrounded in front and at the sides by an elevated peristome, with a central notch, on one side of which an avicularium is usually placed; the half of the peristome bearing the avicularium, as compared with the other, very strongly developed, and often standing out like the rostrum of a *Cellepora*. *Oëcium* hemispherical and perforated. *Zoarium* unilamellar.

Now one of the principal characters included in this description—the elevated peristome, cleft in front—is by no means constant throughout the group. In *R. plicata*, Smitt, *R. bilaminata*, Hincks, and *R. radiatula*, id., it is present, and a very striking feature; but there is no trace of it in *R. ovata*, Smitt, *R. costata*, Lorenz, and *R. scabra*, Fabricius (?). It cannot therefore be employed with propriety as a principal diagnostic.

Verrill refers *R. scabra* and *R. ovata* to "*Mucronella* (restricted)"*; but as his restriction excludes from the genus all forms which are not furnished with "lateral avicularia on one or both sides of the zoëcial aperture" and destitute of "the median avicularium," these species have certainly no claim to a place in it.

On the whole I should be inclined to adopt Lorenz's genus with a revised diagnosis:—

Zoëcia oval, the walls thin, of delicate shining material, smooth (frequently traversed by radiating costæ), entire (destitute of pores); orifice ample, arched above, lower mar-

* "Notice of Recent Additions to the Marine Invertebrata of the North-eastern Coast of America," &c., Proc. U.S. Nat. Mus. 1879, p. 195.

gin straight or slightly curved, within it a median denticle, below it or upon it an aviculiferous rostrum. *Occium* semi-circular or subcrescentic, perforated.

The remarkable delicacy of the material of which the cells are composed in all the known species and the total absence of strong calcification are characteristic points. The walls are thin, with a smooth and shining surface, in some cases traversed by radiating ribs, and of a whitish colour. The operculum which closes the orifice partakes of the same delicacy of structure and is simply membranous.

Rhamphostomella costata, Lorenz. (Pl. XXI. figs. 6, 7, 8.)

Cellepora scabra, Smitt *ex parte*, Kritisk Förteckn. &c., iv. p. 30, pl. xxviii. figs. 186-188.

Smitt has ranked under his typical *C. scabra* the present form, which has been rightly treated as a distinct species by Lorenz. It is abundant amongst the St.-Lawrence dredgings in company with *R. plicata*, Smitt, and *R. bilaminata*, Hincks.

In different stages of growth it varies much in appearance, as a reference to the figures (Pl. XXI. figs. 6 and 8) will show. In figure 7 a group of young marginal zoecia is represented, which agrees in character with the stage of growth figured by Lorenz. A remarkable development of the superficial costæ (also on the younger cells) is shown in figure 8. Radiating from the side of the cell they pass upward to the summit of the suboral rostrum, the delicate white lines forming large areolæ round the margin, through which the smooth and silvery surface is visible. In this condition the aspect of the species is completely changed. An equally striking change is met with if we pass from the border of the colony to the interior. In this region the oecia, which are of large size, are commonly present in great numbers, crowding one upon another and completely concealing the surface of the cells. In this portion of the colony too gigantic avicularia frequently occur in addition to the ordinary form, which is usually reduced in size and much less prominent than usual, the rostrum being either suppressed in great measure or concealed by the larger avicularium which rises in front of it. The latter is very tall and massive and of the same shape as the smaller form; it is either suberect or recumbent. I have not noticed these gigantic avicularia except on cells furnished with an oecium; but they are not always present on these.

A varietal form of this species occurs (var. *cristata*, Pl.

XXI. fig. 6) in which a remarkable change of general aspect is brought about by a very slight and unimportant structural peculiarity. The stout suboral rostrum which bears the avicularium carries on its summit a small transverse bar, which is formed by the beak which bends at one side over the mandible, and by a spinous process or spur which projects from the opposite side. This trifling variation gives a very peculiar and picturesque appearance to the colony. In some cases the zoarium is overspread continuously with a white epidermal investment, beneath which the radiating costæ are faintly traceable (Pl. XXI. fig. 6). The mandible of the avicularium tapers off above into a finely acuminate point which bends inward. Retraction is effected by means of two rather long muscular bands, which are attached to the inner surface, one on each side, about halfway between the apex and the base. Lorenz makes no mention of oral spines, but on marginal cells traces of six are distinguishable.

Range (of the genus). Northern and Arctic Seas.

Family Cellulariidæ.

SCRUPOCELLARIA, Van Beneden.

Scrupocellaria scabra, Van Beneden.
(Pl. XXI. fig. 1.)

In the remarkable form of this well-known northern species which I have figured one important element of the normal structure is altogether wanting—the one, indeed, which constitutes the distinction between the genera *Menipea* and *Scrupocellaria*. The former is characterized by a definite and well-developed system of avicularian appendages, the latter possesses in addition an equally definite system of vibracula. But in this St.-Lawrence form of *S. scabra* the vibracula have disappeared, and, in fact, there is nothing apparent to separate it from *Menipea*. At the same time the avicularia usually present towards the base of the zoœcia on the front surface of the cell are altogether absent, and the lateral avicularium is the sole surviving appendage. In the other structural elements there is a complete resemblance between the present variety and the normal *S. scabra*, so that we cannot hesitate to refer it to the latter species. I have already pointed out that in *S. scabra* “the vibracula are commonly wanting on many of the cells” *; but though this shows a certain amount of instability in the structure, it would not prepare us for its total obliteration.

* ‘History of the British Marine Polyzoa,’ vol. i. p. 50.

In one of his papers * Jullien has stated that he had seen a colony of *Scrupocellaria scabra* from Greenland on which not a single vibraculum was present, but the avicularia on the front surface were strongly developed. In the case of the St.-Lawrence form the latter also have disappeared. It may be noted that in this species, in which the vibracula are of such uncertain occurrence, these appendages are of most rudimentary structure, and a very slight modification of the avicularium. The scutum in the present form is very highly developed and of exceptionally large size, in some cases almost completely concealing the oecium.

The normal form of *S. scabra* occurs in the St. Lawrence.

Range. Gaspé Bay, St. Lawrence; Greenland.

Family **Escharidæ** (part.), Smitt.

PORELLA, Gray.

Porella concinna, Busk. (Pl. XXI. fig. 4.)

This is one of the most abundant species in the St. Lawrence, and exhibits a large amount of variation. One of the prettiest varieties is represented in figure 4. The remarkable diversity in the condition of the cell-wall, which is such a marked characteristic of the Polyzoa, receives ample illustration in this species; commonly the surface is uniformly granulous, and a line of rather large punctures runs round the margin of the cells. In other cases the surface is perfectly smooth and white and the margin of the cell is strongly sinuated and punctured.

This very marked form is the *Lepralia Belli* of Dawson, and is extremely abundant in the St. Lawrence. In yet another (which occurs in the North Pacific) the whole surface of the cell, except the suboral umbo, is covered with rather large punctures; in another even the marginal punctures are obliterated by the calcification or altogether absent. Such facts, and they might be multiplied to almost any extent, suggest a serious objection to Dr. Jullien's proposal to employ the characters of the front wall for classificatory purposes—to make them primary tests of natural affinity. The practical difficulties in the way would seem to be great; but I am by no means disposed to deny that in many cases they may yield valuable help to the systematist.

In the cells on the growing edge of the colony and in the neighbouring region the avicularium is borne on the summit

* "Dragages du Travailleur. Bryozoaires: espèces draguées dans l'océan Atlantique en 1881," Bull. de la Soc. Zool. de France, t. vii. (1882).

of a prominent mamillary rising, which extends across the front wall from side to side immediately below the orifice. In the older cells this is completely enveloped and concealed by the growing accumulations of calcareous matter. Lorenz has met with specimens in which the condition of the younger cells is permanent and the avicularian mamillæ are conspicuous throughout the colony*. So completely is the appearance changed in this specimen that he was at first disposed to refer it to a distinct species. He describes the cell as being "von milchweisser Farbe und ziemlich dünnwandig." From some cause there had been an arrest of calcification.

In many colonies the avicularia are present in great numbers distributed irregularly over the cells; sometimes one is placed immediately above the orifice, sometimes at the side of it or on each side. Frequently these sporadic avicularia are borne on a prominent mamilla.

Range. *P. concinna* has a very wide range. Common in the Northern and Arctic seas; Britain; Mediterranean; Australia.

Porella acutirostris, Smitt. (Pl. XXI. fig. 5.)

This well-marked species has been described and figured by Smitt; but as yet, I believe, no diagnosis has appeared in English, whilst the figures accompanying the excellent account of it which we have from the Swedish author are too small to be quite satisfactory †.

Zoecia somewhat elongate-oval, distinct, convex, disposed in regular lines; surface minutely granular, of a whitish colour; orifice much broader than high, arched above, lower margin straightish, slightly curved inward in the centre; peristome not elevated (except in the fertile cells); immediately below the orifice a prominent mamillary rising, extending across the cell, bearing a triangular *avicularium*, the mandible directed straight outwards. *Ocium* large, prominent, globose, with a granular surface; a projecting border above the oral arch which meets the elevated peristome at each side.

The *zoecia* in this species are larger than those of its congener *P. concinna* and more distinct and convex. The avicularian umbo rises much more abruptly than in *P. concinna*, and it remains distinct over the whole colony, very slightly affected by the calcification in the specimens which I have

* 'Bryozoën von Jan Mayen,' *l. c.* p. 8, pl. vii. fig. 6.

† Lorenz (*l. c.* p. 8) has given a brief notice of some of the characters of the *zoecium*.

examined. The oœcium, with its conspicuous oral border, is a striking feature as compared with that of *P. concinna*.

Smitt describes the front wall as thickly punctured; but in the St.-Lawrence specimens it is uniformly granular; there are faint traces of marginal punctures.

Range. Spitzbergen; Greenland; Jan Mayen.

SMITTIA, Hincks.

Smittia producta, Packard. (Plate XXI. fig. 2.)

A number of species from the coast of Labrador have been described by Packard*, of which the above is one. I confess that I have been unable to identify most of them with any certainty, even with the help of Prof. Verrill's notes upon them. The diagnosis is generally insufficient, and the figures, when there are any, are not of a kind to give much assistance. The form which I have figured (Pl. XXI. fig. 2) I refer doubtfully to Packard's species. It answers pretty well to his description, which is not a very precise one, and in the shape of the orifice and the cell it agrees with his figure, which is small and obscure, and gives scarcely any detail. I have received from Sir J. W. Dawson a tablet bearing a specimen which is marked "*Lepralia producta*, probably Packard's spec.," and which is identical with the form which I refer to this species.

It is very doubtful how far it is well to allow the claim of defective diagnosis and to give a place in our system to identifications which are of necessity largely conjectural. I believe that science would be the gainer, while the student would be spared much fruitless labour, by the exercise of some rigour in this matter.

The following is a description of the St.-Lawrence species, which seems to be probably identical with Packard's *Lepralia producta*.

Smittia producta, Packard (sp.).

Zoæcia large, ovate, often pointed below, irregularly disped, very slightly convex (almost flat when old), surrounded by raised lines, usually highly calcified, the walls thick and dense; surface covered with numerous punctures, a conspicuous line of larger pores round the margin; (in young cells) roughened by ridge-like elevations and glistening, (in older states) of a dull whitish colour, almost smooth or minutely granu-

* "List of Animals dredged near Caribou Island, Southern Labrador, 1860," Canadian Naturalist and Geologist, vol. viii. (1863) p. 401.

lated; orifice (primary) semicircular, lower margin straight; (secondary) orbicular, with a deep sinus, tapering off gradually to a point below; peristome thickened, slightly raised, on each side of the sinus a nodulous collar-like rising. *Oecium* subglobose, prominent (when not concealed by the progress of calcification), a projecting rim round the oral arch; surface smooth or minutely granulated.

Avicularia none.

There is considerable variation in the form of the secondary orifice, dependent upon age; in the adult state it is as described above. Young fresh colonies are reddish brown, but in older specimens the surface is of a dull white colour.

Verrill has referred Packard's species to *Escharoidea Sarsii*, but the history of the development of the cell is quite different in the two forms, and in no stage of growth is there any trace of the oral avicularium which is so essential a character of the latter.

MUCRONELLA, Hincks.

Mucronella spinulifera, n. sp. (Pl. XXI. fig. 3.)

Zoecia rudely ovate, often much elongated and truncate below, sometimes pyriform, variable in shape and size, quincuncial, but not regularly so, very convex and divided by deep sutures, strongly calcified; surface thickly covered with small granules, shining; orifice well arched above, the sides curved outwards, lower margin straightish, with a slight elevation in the centre which is carried up into a very small spinule; peristome unarmed and not elevated. *Oecium* inconspicuous, subimmersed, rounded, broad in proportion to its height; surface granular. *Avicularia* none.

Colony of a reddish colour.

This is a somewhat striking form. The colour, the glistening granular surface, the prominent deeply-divided cells, and the peculiar character of the orifice, with its single spinule on the lower margin, combine to give it a very distinctive aspect. So far as I know it is undescribed.

Hab. On shells, stones, &c.

Family Eucratiidæ.

SCRUPARIA, Hincks.

Scruparia clavata, Hincks.

This is an interesting addition to the fauna of the St. Lawrence. *S. clavata* was first discovered in Filey Bay, on

the Yorkshire coast, where I met with it abundantly on some of the Crisiidæ. I have also found it in Lamplash Bay and on a *Cellularia* from Shetland (probably). These were the only known localities for it. It now proves to be abundant amongst the St.-Lawrence dredgings on *Crisia*, which seems to be its favourite habitat. It takes its place amongst the Northern forms which have migrated to our coasts by way of Shetland.

Family Pedicellinidæ, Hincks.

PEDICELLINA, Sars.

Pedicellina nutans, Dalyell. (Pl. XXI. fig. 9.)

The form which I have identified with Dalyell's species * occurs plentifully and of large size in the St. Lawrence; and a further examination of it has confirmed me in my opinion that it is specifically distinct from *P. cernua*.

Jullien † has questioned the validity of this species and considers that it may probably be no more than a variety of *P. cernua*. But he has hardly done justice to the characters upon which I rely as distinctive. The small size comparatively of the zoecium and the constriction of the pedicel below it are by no means the only points nor yet the most significant in which it differs from the latter species. I have insisted on the remarkable difference between the shape of the body in the two forms, which is well shown in my woodcuts, figs. 39 and 40, as a most important character. There is a *group* of distinctive characters which, in my judgment, amply justifies my view. The very characteristic pedicel (broad below and tapering rapidly upward to a subacuminate extremity), the constant absence of spines, the symmetrical vase-like body, destitute of the gibbosity on the dorsal side, so characteristic of *P. cernua*, are significant points of difference which prevent me from accepting Dr. Jullien's criticism.

The Pedicellinidæ abound in the Northern seas. The St.-Lawrence dredgings have already yielded *P. nutans*, Pallas, *Barentsia major*, a fine new species described in my last paper, and *B. gracilis*, Sars. *B. bulbosa*, Hincks, is a native of Barents Sea.

I have figured *B. gracilis* (Pl. XXI. fig. 10) for comparison with *B. major* ('Annals' for March 1888, pl. xv. fig. 2) and also to show the great variability in the length of the muscular cylinder.

* 'British Marine Polyzoa,' vol. i. p. 567, woodcuts figs. 37, 38, and 40.

† 'Bryozoaires recueillis par la Mission du Cap Horn,' pp. 1-10.

Dr. Jullien's critical remarks on the classification of the Pedicellinidæ I hope to notice on some future occasion.

EXPLANATION OF PLATE XXI.

- Fig. 1. *Scrupocellaria scabra*, Van Beneden. Form destitute of vibracula.
 Fig. 2. *Smittia producta*, Packard.
 Fig. 3. *Mucronella spinulifera*, n. sp.
 Fig. 4. *Porella concinna*, Busk, var.
 Fig. 5. *Porella acutirostris*, Smitt. a. Orifice of zoecium. b. That of *P. concinna*.
 Fig. 6. *Rhamphostomella costata*, Lorenz, var. *cristata*.
 Fig. 7. The same. Group of marginal cells.
 Fig. 8. The same. Young cells, showing the superficial costæ.
 Fig. 9. *Pedicellina nutans*, Dalyell.
 Fig. 10. *Barentsia gracilis*, Sars. (For comparison with *B. major*, Hincks, 'Annals' for March 1888, pl. xv. fig. 2.)

LIII.—Description of a new Species of Mus from South Australia. By OLDFIELD THOMAS.

Mus argurus, sp. n.

Size about equal to that of a small *Mus nanus* or large *M. albo-cinereus*. Fur crisp or even slightly spinous. General colour above pale sandy rufous, the hairs slate-coloured at their bases. Ears very thinly covered with fine white hairs, rounded, laid forward they reach just beyond the middle of the eye. Muzzle and underside of body white, the line of demarcation on sides not sharply marked; hairs of chest and belly pale rufous basally. Hands and feet pure white. Soles smooth, naked, with six well-developed rounded pads, the posterior one elongated. Tail rather longer than the head and body, quite uniform in colour above and below, more thickly covered with hairs than usual, the hairs pure white, the scales (which average about thirteen or fourteen to the centimetre) pale flesh-coloured; tip of tail slightly pencilled. Palate-ridges nine, three anterior undivided and six divided, interdental, of which the anterior is directly transverse, while the others are slanted backwards mesially.

Skull smooth and unridged. Nasal and interorbital regions flat, evenly convex when viewed in profile; supraorbital edges sharply square, but not beaded or ridged. Interparietal broad antero-posteriorly, its diameter in this direction more than half its transverse breadth. Anterior edge of